APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/634,854	08/06/2003	Michael Philip Fitton	241205US2CRL	6545

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EXAMINER
JAMAL, ALEXANDER

ART UNIT	PAPER NUMBER
2614	

NOTIFICATION DATE	DELIVERY MODE
02/19/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS,
WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>25 November 2008</u>.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☐ Claim(s) _____ is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-20,23-42 and 44</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a) ☒ All b) ☐ Some * c) ☐ None of:

       1. ☒ Certified copies of the priority documents have been received.

       2. ☐ Certified copies of the priority documents have been received in Application No. _____.

       3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
     Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
     Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Examiner withdraws the previous set of rejections and submits a new set of non-final

rejections based on newly discovered prior art.

2. The examiner notes an additional 102 rejection based on additional prior art Koo. The

examiner notes that this patent may read on the dependant claims as well.

3. In the submitted claimset, claim 20 is indicated as 'currently amended' but there are no

visible amendments to the claim. Clarification is requested.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

2. Claims 1-2, 6-14, 20, 23-24, 28-35, 37, 42, 44 rejected under 35 U.S.C. 103(a) as being

unpatentable over Dabak et al [US 20020075904 A1], and further in view of Wilhelmsson

(6901120).

Regarding **claim 1,** Dabak et al discloses a method of determining an estimated response of a

channel of a packet data communications system shown in Fig. 1, the method comprising:

receiving data using receiver (100) for symbols of a data packet transmitted over the channel [Fig. 1;

Para: 0012];

determining a training sequence using one or more data portions or fields of the data packet (i.e. header

or payload) [Figs. 2-5; Para: 0001; 0013-0016]; and

training an adaptive filter (104) using the training sequence and the received symbols to determine the

estimated channel response [Figs. 1-2; Para: 0012-0013; 0019]. In Dabak's system the channel

estimation is performed on header portion and the data field is a variable length (para. 16) (variable

portion). In Dabak's system the header/data segment comprises bits used to create a channel estimation

for an equalizer. The header portion of the packet is a fixed portion. However, Dabak does not specify

that the training is based specifically on the data portions of the packet (in which case the training

sequence would be variable and depend on the amount of data bits transferred).

Wilhelmsson discloses a bluetooth transmission system where the training is performed on bits in

the packet. Wilhelmsson teaches a design tradeoff (spectral efficiency versus accuracy of estimation)

and discloses that the data portion of the packet may be used for training/channel estimation (Col 2 lines

5-25). It would have been obvious to one skilled in the art that the variable length data portion of Dabak's

packets could be used to train the signal for the advantage of greater spectral efficiency (not wasting

bandwidth on the training bits). In this case the training signal sequence would be dependant upon the

variable amount of data bits.

Claim 44 is essentially similar to claim 23 and is rejected for the reasons stated above apropos of claim
23.

Claim 23 is essentially similar to claim 1 except for a memory to store the received symbol data. Dabak et
al teach a receiver (100) to receive symbols of a data packet, wherein the memory (not shown) is
inherently present to store the received symbol data [Fig. 1; 0012].
Claim 20 is essentially similar to claim 1 except for a Bluetooth data receiver. Dabak et al further teach a
Bluetooth data receiver (100) [Fig. 1; Para; 0013-0014; 0019; claim 2].

Regarding **claim 24**, Dabak et al further disclose the method, wherein the determining comprises determining one or more substantially constant elements of the one or more variable data portions or fields of the data packet [Figs. 2-4; Para: 0013].
Claim 2 is essentially similar to claim 24 and is rejected for the reasons stated above apropos of claim 24.

Regarding **claim 28,** Dabak et al further disclose the method, wherein the determining comprises decoding data for at least a portion of a header of a the packet [Fig. 2; Para: 0013].
Claim 6 is essentially similar to claim 28 and is rejected for the reasons stated above.
Regarding **claim 29,** Dabak et al further disclose the method, wherein the determining comprises decoding data for at least a portion of a user data payload of a the packet [Fig. 4; Para: 0012; 0014; 0016].
Claim 7 is essentially similar to claim 29 and is rejected for the reasons stated above.
Regarding claim 8, the feature of checking the decoded data for errors is inherently present in a communication system.
Claim 30 is essentially similar to claim 8 and is rejected for the reasons stated above.

Regarding **claim 31,** Dabak et al further disclose the method,
comprising repeating the training using the training sequence [Para: 0013].
Claim 9 is essentially similar to claim 31 and is rejected for the reasons stated above.
Claim 10 is an inherent feature of the adaptation method of repeating the training using the training sequence, such as an LMS algorithm.
Claim 32 is essentially similar to claim 10 and is rejected for the reasons stated above.
Regarding **claim 33**, Dabak et al further disclose the method, wherein the determining comprises determining a plurality of the training sequences for the data packet, the training determining a first estimated channel response using a first the training sequence and a second estimated channel response using a later the training sequence [Para: Para: 0015- 0017].

Claim 11 is essentially similar to claim 33 and is rejected for the
reasons stated above.
Regarding **claims 12-14, 34-35, 37**, the limitations are shown above.
Regarding **claim 42,** Dabak et al further teach the method wherein the packet data communication is a High Rate Bluetooth communication system [Para: 0017-0019; claims 12-13].

11. **Claims 3-5, 25-27** are rejected under 35 U.S.C. 103(a) as being unpatentable over Dabak et al in view of Wilhelmsson (6901120) as applied to claim 1 above, and further in view of Rafle et al [US 20020196844 A1].
Regarding claim 3, Dabak and Wilhelmsson do not teach expressly determining a training sequence based on the probabilities for values of bits.
Rafle et al teach several classes of approaches to adaptive equalization including a maximum likelihood sequence estimator (MLSE) [Para: 0009-0018].
At the time of the invention, it would have been obvious to a person of ordinary skill in the art to adopt any one of the approaches to adaptive equalization including a maximum likelihood sequence estimator (MLSE) to determine a training sequence based on the probabilities for values of bits subject to circuit, system and design constraints.
Claims 4-5, 25-27 are rejected for the reasons stated in claim 3 above.

12. **Claims 15-19, 36, 38-41** are rejected under 35 U.S.C. 103(a) as being unpatentable over Dabak et al

in view of Wilhelmsson (6901120) as applied to claim 11 above, and further in view of Kingston et al
[US 6,373,910 B2].
Regarding **claim 15,** Dabak and Wilhelmsson do not teach expressly an channel estimator to initialize the
adaptive filter.
Kings ton et al teach a channel estimator comprising an initializer to initialize the adaptive filter using the
first estimated channel response for determining the second estimated channel response [col. 12, line 19
to col. 13, line 51].
At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine
the teachings of Kingston et al with Dabak et al in order to initialize the adaptive filter (i.e. equalizer) of
Dabak et al to speed up the convergence of the filter.
Regarding claims **16-19, 36, 38-41,** the limitations are shown above.

-additional rejection of independent claims-

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on
> sale in this country, more than one year prior to the date of application for patent in the United States.

2.   **Claims 1, 20, 23 and 44** rejected under 35 U.S.C. 102(b) as being anticipated by Koo [US

5,047,859].

Regarding **claim 1,** Koo discloses a channel estimator for a packet data communications

receiver, as shown in Fig. 2, the channel estimator comprising:

an input (R(i)) to receive data for symbols of a data packet transmitted over a channel to the receiver [Fig.

2]; a memory (11) to store the received symbol data [Figs. 1-2; col. 4, lines 31-49];

a training sequence (i.e. test sequence) determiner to determine a training sequence using one or more

variable data portions or fields of the data packet [col. 2, lines 3-23; col. 3, line 20 to col. 4, line 49; col. 6,

lines 61-67]; and

an adaptive filter coupled to the memory and to the training sequence determiner and configured to use

the received symbol data and the training sequence to determine an estimate of a response of the

channel [Fig. 5, col. 7, lines 40-55]. The packet also contains header information (fixed).

Claims 20, 23 and 44 are essentially similar to claim 1 and are rejected for the reasons stated

above.

13. The prior art made of record and not relied upon is considered pertinent to applicant's
disclosure.
Yousef [US 7,263,123 B2] teaches a method of fast computation of coefficients for a variable
delay decision feedback equalizer [Figs. 1-15; Abstract].

Any inquiry concerning this communication or earlier communications from the examiner

should be directed to Alexander Jamal whose telephone number is 571-272-7498. The examiner

can normally be reached on M-F 9AM-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor,

Curtis A Kuntz can be reached on 571-272-7499. The fax phone numbers for the organization

where this application or proceeding is assigned are **571-273-8300** for regular communications

and **571-273-8300** for After Final communications.

/Alexander Jamal/

Primary Examiner, Art Unit 2614

Examiner Alexander Jamal

February 17, 2009